

## CLAIMS

I claim:

1           1.     A system for desalinating water, comprising:  
2           at least one mixer for mixing saltwater with at least one ionized gas to produce a  
3     mixture of ionized gas and saltwater;  
4           at least one filter for removing coagulated particles from the mixture of ionized gas  
5     and saltwater;  
6           at least one disinfectant generator for generating a disinfectant from a saltwater; and  
7           at least one reaction chamber for mixing the disinfectant with the mixture of ionized  
8     gas and saltwater, wherein the mixture of saltwater and ionized gas is separated into a salt  
9     slurry and desalinated water.

1           2.     The system of claim 1, wherein reaction chamber further comprises at least  
2     one fogging nozzle for delivering the mixture of ionized gas and saltwater to the at least one  
3     reaction chamber.

1           3.     The system of claim 1, further comprising at least one filter upstream of the  
2     mixer.

1           4.     The system of claim 3, wherein the at least one filter upstream of the mixer  
2     comprises a strainer.

1           5.     The system of claim 1, at least one filter for removing coagulated particles  
2 comprises a between about a 30 micron filter and about a 50 micron filter.

1           6.     The system of claim 1, wherein the at least one reaction chamber operates at a  
2 negative internal pressure.

1           7.     The system of claim 1, further comprising an ionized gas generator for  
2 providing ionized gas to the at least one mixer.

1           8.     The system of claim 7, wherein the ionized gas generator includes a gas  
2 pathway for exposing a gas to ultraviolet radiation and to a magnetic field as the gas is  
3 passed through the ionized gas generator.

1           9.     The system of claim 7, wherein the ionized gas generator is formed from a  
2 plurality of chambers, each chamber containing at least one ultraviolet lamp and each  
3 chamber adapted to allow a gas to pass the through the ionized gas generator.

1           10.    The system of claim 9, wherein the plurality of chambers are coupled in  
2 parallel.

1           11.    The system of claim 1, wherein the at least one filter is comprised of a  
2 polarizable filtration medium having finely-divided particles of glass and polarizable  
3 ceramics.

1           12.    The system of claim 1, wherein the disinfectant generator comprises a housing  
2   containing a plurality of conduits having electrical cells for exposing electricity to saltwater  
3   flowing through the conduits.

1           13.    The system of claim 12, wherein the disinfectant generator further comprises a  
2   single inlet coupled to a header that distributes saltwater to the plurality of conduits and at  
3   least one of the conduits has a valve upstream of an electrical cell and a valve downstream of  
4   the electrical cell.

1           14.    The system of claim 13, wherein the disinfectant generator further comprises  
2   at least one sensor positioned downstream of an electrical cell in at least one of the plurality  
3   of conduits.

1           15.    The system of claim 13, wherein the disinfectant generator further comprises  
2   at least one bypass conduit for controlling flow of saltwater through the conduits of the  
3   disinfectant generator.

1           16.    A system for desalinating water, comprising:  
2           at least one ionized gas injector for injecting at least one ionized gas into saltwater to  
3   produce a mixture of ionized gas and saltwater;  
4           at least one filter for removing coagulated particles from the mixture of ionized gas  
5   and saltwater;

6           at least one disinfectant injector for injecting at least one disinfectant into the  
7   saltwater; and  
8           at least one reaction chamber for mixing the disinfectant with the mixture of ionized  
9   gas and saltwater, wherein the mixture of saltwater and ionized gas is separated into a salt  
10   slurry and desalinated water.

1           17.    The system of claim 16, wherein reaction chamber further comprises at least  
2   one fogging nozzle for delivering the mixture of ionized gas and saltwater to the at least one  
3   reaction chamber.

1           18.    The system of claim 16, further comprising at least one mixer for mixing  
2   saltwater with at least one ionized gas from the at least one ionized gas injector to produce a  
3   mixture of ionized gas and saltwater.

1           19.    The system of claim 16, further comprising at least one filter upstream of the  
2   mixer.

1           20.    The system of claim 16, at least one filter for removing coagulated particles  
2   comprises a between about a 30 micron filter and about a 50 micron filter.

1           21.    The system of claim 16, further comprising an ionized gas generator for  
2   providing ionized gas to the at least one mixer.

1           22.    The system of claim 21, wherein the ionized gas generator includes a gas  
2    pathway for exposing a gas to ultraviolet radiation and to a magnetic field as the gas is  
3    passed through the ionized gas generator.

1           23.    The system of claim 21, wherein the ionized gas generator is formed from a  
2    plurality of chambers, each chamber containing a plurality of ultraviolet lamps and each  
3    chamber adapted to allow a gas to pass the through the ionized gas generator.

1           24.    The system of claim 16, wherein the at least one filter is comprised of a  
2    polarizable filtration medium having finely-divided particles of glass and polarizable  
3    ceramics.

1           25.    The system of claim 16, further comprising a disinfectant generator formed  
2    from a plurality of conduits having electrical cells for exposing electricity to saltwater  
3    flowing through the conduits.

1           26.    The system of claim 25, wherein the disinfectant generator further comprises a  
2    single inlet coupled to a header that distributes saltwater to the plurality of conduits and at  
3    least one of the conduits has a valve upstream of an electrical cell and a valve downstream of  
4    the electrical cell.

1           27.    The system of claim 25, wherein the disinfectant generator further comprises  
2   at least one bypass conduit for controlling flow of saltwater through the conduits of the  
3   disinfectant generator.

1           28.    A method of converting saltwater to desalinated water, comprising:  
2           passing saltwater to a mixer where at least one ionized gas is mixed with the saltwater  
3   to create a mixture of saltwater and ionized gas;  
4           passing the mixture of saltwater and ionized gas into at least one filter to remove at  
5   least a portion of coagulated particles from the mixture;  
6           mixing the mixture of saltwater and ionized gas with at least one disinfectant to  
7   produce a mixture of saltwater, ionized gas, and at least one disinfectant;  
8           passing the mixture of saltwater, ionized gas, and at least one disinfectant into a  
9   reaction chamber, whereby substantially all of the salt is removed from the mixture and  
10   forms a salt slurry and the remaining water is desalinated water.

1           29.    The method of claim 28, further comprising passing saltwater through at least  
2   one filter upstream of the mixer.

1           30.    The method of claim 28, further comprising generating at least one ionized  
2   gas.

1           31.    The method of claim 30, wherein generating at least one ionized gas comprises  
2   exposing air to ultraviolet radiation and a magnetic field.

1           32.     The method of claim 31, wherein generating at least one ionized gas comprises  
2     passing air through at least one chamber containing a plurality of ultraviolet lamps  
3     surrounding a plurality of magnets forming an electrical field, wherein the magnets are  
4     positioned so that adjacent ends of adjacent magnets have like polarity.

1           33.     The method claim 28, further comprising generating at least one disinfectant  
2     and mixing the at least one disinfectant with saltwater.

1           34.     The method of claim 33, wherein generating at least one disinfectant  
2     comprises passing saltwater through one or more chambers in which electricity is passed  
3     through the saltwater.